

Recent Upgrades to NASA SPoRT Initialization Datasets for the Environmental Modeling System

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The NASA Short-term Prediction Research and Transition (SPoRT) Center has developed several products for its National Weather Service (NWS) partners that can initialize specific fields for local model runs within the NOAA/NWS Science and Training Resource Center (STRC) Environmental Modeling System (EMS). In last year's NWA abstract on this topic, the suite of SPoRT products supported in the STRC EMS was presented, which includes a Sea Surface Temperature (SST) composite, a Great Lakes sea-ice extent, a Green Vegetation Fraction (GVF) composite, and NASA Land Information System (LIS) gridded output. This abstract and companion presentation describes recent upgrades made to the SST and GVF composites, as well as the real-time LIS runs. The Great Lakes sea-ice product is unchanged from 2011.

The SPoRT SST composite product has been expanded geographically and as a result, the resolution has been coarsened from 1 km to 2 km to accommodate the larger domain. The expanded domain covers much of the northern hemisphere from eastern Asia to western Europe (0°N to 80°N latitude and 150°E to 10°E longitude). In addition, the NESDIS POES-GOES product was added to fill in gaps caused by the Moderate Resolution Imaging Spectroradiometer (MODIS) being unable to sense in cloudy regions, replacing the recently-lost Advanced Microwave Scanning Radiometer for EOS with negligible change to product fidelity. The SST product now runs twice per day for Terra and Aqua combined data collections from 0000 to 1200 UTC and from 1200 to 0000 UTC, with valid analysis times at 0600 and 1800 UTC. The twice-daily compositing technique reduces the overall latency of the previous version while still representing the diurnal cycle characteristics. The SST composites are available at approximately four hours after the end of each collection period (i.e. 1600 UTC for the nighttime analysis and 0400 UTC for the daytime analysis).

The real-time MODIS GVF composite has only received minor updates in the past year. The domain was expanded slightly to extend further west, north, and east to improve coverage over parts of southern Canada. Minor adjustments were also made to the manner in which GVF is calculated from the distribution of maximum Normalized Difference Vegetation Index from MODIS. The presentation will highlight some examples of the substantial inter-annual change in GVF that occurred from 2010 to 2011 in the U.S. Southern Plains as a result of the summer 2011 drought, and the early vegetation green-up across the eastern U.S. due to the very warm conditions in March 2012.

Finally, the SPoRT LIS runs the operational Noah land surface model (LSM) in real time over much of the eastern half of the CONUS. The Noah LSM is continually cycled in real time, uncoupled to any model, and driven by operational atmospheric analyses over a long-term, multi-year integration. The LIS-Noah provides the STRC EMS with high-resolution (3-km) LSM initialization data that are in equilibrium with the operational analysis forcing. The Noah LSM within the SPoRT LIS has been upgraded from version 2.7.1 to version 3.2, which has improved look-up table attributes for several land surface quantities. The

surface albedo field is now being adjusted based on the input real-time MODIS GVF, thereby improving the net radiation. Also, the LIS-Noah now uses the newer MODIS-based land use classification scheme (i.e. the International Biosphere-Geosphere Programme [IGBP]) that has a better depiction of urban corridors in areas where urban sprawl has occurred. STRC EMS users interested in initializing their LSM fields with high-resolution SPoRT LIS data should set up their model domain with the MODIS-IGBP 20-class land use database and select Noah as the LSM.